

Exploration Lighting Technologies

Element Lead: Dan Shultz, NASA-KSC

Element Scientist: Dr. John Sager, NASA-KSC

PM: Dan Shultz, NASA-KSC

Objective:

- ◆ Test and/or develop efficient, high quality lighting systems for CEV, LSAM, and surface systems. Explore the use of LED and direct solar light capture systems with acceptable spectrum for human vision.
 - Purchase LEDS (e.g., RGB or “white”) and assemble fixtures to provide candidate lighting for human vision and activity.
 - Assess power draw, irradiant output, touch temperature, and lumen maintenance of different combinations. Conduct spectral distribution scans and plot on chromaticity charts and assess color temperature
 - Develop prototype solar collector and light conduit system for Lunar surface in conjunction with Physical Sci., Inc. SBIR.

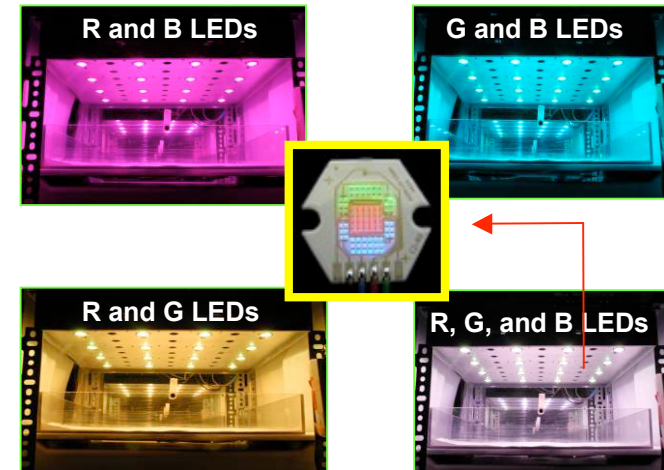
Relevance/Impact:

- ◆ Cabin lighting for the Orbiter includes 20 fluorescent and 4 incandescent lamps drawing over 560 W. Lighting for CEV with LED systems could save power, increase safety (remove Hg), and provide more versatile spectral control for humans.
- ◆ ISS lighting is based on fluorescent lamps which are now experiencing a much shorter MTBF, current supply of GLA’s will not meet the ISS Program’s 2016 end date.

Approach:

- ◆ Test LEDs for candidate lighting configurations to assess power, mass, safety, lumen maintenance and visual acceptability in a cabin like environment (potentially using a retired Orbiter for short duration tests).
- ◆ Support JSC human research with lighting data and prototype fixture development for lighting research. Groups involved in lighting projects include the flight crew surgeons, human factors group and habitation engineering.

Kennedy Space Center



Norlux Hex LEDs in different combinations

Schedule

Key Milestones/Deliverables	Date